#### ASSIGNMENT 6

Textbook Assignment: "Asphalt Plant Supervisor," and "Well Drilling Superisor," pages 8-11 through 9-17.

Learning Objective: (continued): Recognize the operations of an asphalt plant.

- 6-1. Using table 8-1, what is the distributor spraying temperature for asphalt emulsion SS-1h?
  - 1. Between 50°F-140°F
  - 2. Between 75°F-130°F
  - 3. Between 110°F-160°F
  - 4. Between 135°F-175°F
- 6-2. Final metering of mineral filler to a mix is accomplished through what device?
  - 1. A variable speed vane
  - 2. A screw feeder
  - 3. A belt feeder
  - 4. One of the above, depending on the material being handled

Learning Objective: Recognize the operational processes of a batch asphalt plant.

- 6-3. Which of the following units is a distinguishing feature of a batch asphalt plant?
  - The cold aggregate feed unit
  - 2. The batching unit
  - 3. The dryer unit
  - 4. The dust collector unit
- 6-4. From the hot bins, what size aggregates are deposited into the weigh-hopper first?
  - 1. Coarse
  - 2. Intermediate
  - 3. Fine
  - 4. Mineral filler

- 6-5. A pugmill's "live zone" is the net volume in cubic yards below a line extending across the top arc of the inside body shell radius, with shafts, liners, paddles, and tips deducted.
  - 1. True
  - 2. False
- 6-6. In a batch asphalt plant, in what location do the aggregates, mineral filler, and asphalt get mixed together?
  - 1. Dryer
  - 2. Weigh-hopper
  - 3. Pugmill
  - 4. Asphalt weigh bucket
- 6-7. In what manual can the batch asphalt plant supervisor find details on the setup and adjustment of the automatic equipment?
  - 1. NAVFAC Supervisory
    Instructions Manual
  - 2. COMSECOND/COMTHIRDNCBINST Equipment Management Manual
  - 3. Manufacturer operator's manual
  - 4. Alfa company operations manual

Learning Objective: Recognize the operational processes of a continuous-flow asphalt plant.

- 6-8. What factor must be known at all times in order to maintain constant asphalt proportioning?
  - 1. The temperature of the aggregate
  - 2. The output temperature of the dryer
  - 3. The temperature of the hot bins
  - 4. The temperature of the asphalt

- 6-9. the movement of materials within a continuous-flow plant pugmill?
  - They are confined in the mixer chamber
  - 2. They are propelled toward discharge
  - 3. They are continuously mixed in the mixer chamber
  - 4. They are continuously mixed, weighed, then discharged
- 6-10. What period of time begins when all the combined mineral aggregates are in the mixer and ends when the gate is open?
  - 1. The total mixing time
  - 2. The wet mixing time
  - The dry mixing time
  - 4. The shortest mixing time
- 6-11. What period of time starts with the asphalt application and ends with the opening of the discharge gates?
  - 1. The total mixing time
  - 2. The wet mixing time
  - 3. The dry mixing time
  - 4. The shortest mixing time
- What environmental condition 6-12. makes asphalt film harden on the aggregates?
  - 1. Exposure to air
  - 2. Exposure to moisture
  - 3. Exposure to heat and air
  - 4. Exposure to moisture and air
- Which of the following is NOT 6-13. a part of the automatic control system for a continuous-flow plant?
  - 1. Burner controls
  - 2. Mix discharge
  - 3. Dryer control
  - 4. Mixer and gradation cutoffs

Learning Objective: Recognize the operational processes of a drum-mix asphalt plant.

- What are the characteristics of 6-14. In a drum-mix plant, in what location is aggregate mixed with the asphalt?
  - 1. In the mix surge silo
  - 2. In the hot-mix conveyer
  - 3. In the dust collector
  - 4. In the dryer
  - 6-15. The drum-mix plant gradation control unit proportions all the aggregate before it enters the mixing drum.
    - 1. True
    - 2. False
  - 6-16. What factor is the basis for determining the quantity of asphalt delivered into the drum?
    - 1. The weight of the aggregate
    - 2. The gradation of the aggregate
    - 3. The drum-mix output requirement
    - 4. The speed of the in-line belt feeder
  - 6-17. What section in a drum-mixer heats and dries the aggregate?
    - 1. Primary
    - 2. Intermediate
    - 3. Secondary
    - 4. Third
    - 6-18. What condition creates an oily coating on the aggregate particles?
      - 1. Aggregate not heated
      - 2. An unbalanced distribution of asphalt
      - 3. A lack of balance in the burner operation
      - 4. Drum-mixer speed is too slow
    - 6-19. The drum-mix plant produces a batch-flow of asphalt that can be temporarily stored in the surge silo.
      - 1. True
      - 2. False

Learning Objective: Identify the properties of bituminous surfacing materials.

- 6-20. What is/are the function(s) of the aggregates in a asphalt surface?
  - Transmits the load from the surface to the subgrade
  - 2. Absorbs the abrasive wear of the traffic
  - 3. Provides a nonskid surface
  - 4. All of the above
- 6-21. Which of the following factors is required to support the bearing action on a bituminous wearing surface?
  - Larger aggregates placed in the mix design
  - Subgrade and base course must have adequate thickness, strength, cohesion, and bearing capacity
  - 3. Upgrade the amount of asphalt in the mix
  - 4. Give the mix adequate curing time
- 6-22. Which of the following is a bituminous surfacing material?
  - 1. Emulsion
  - 2. Tar
  - 3. Asphalt bitumen
  - 4. Each of the above
- 6-23. A container of bituminous material labeled with the symbol AC indicates it contains which of the following materials?
  - 1. Asphalt cutback
  - 2. Asphalt cement
  - 3. Asphalt emulsion
  - 4. Anionic-cationic asphalt

- 6-24. When used with asphalt cement, which of the following distillates allows for slow curing after application to a roadway?
  - 1. Naphtha
  - 2. Kerosene
  - 3. Fuel oil
  - 4. Gasoline
- 6-25. Which of the following viscosity grades of an MC asphalt bitumen is considered the most fluid?
  - 1. 30 to 60
  - 2. 200 to 800
  - 3. 800 to 1,000
  - 4. 1,000 to 3,000
- 6-26. When added to asphalt cement, which of the following produces an asphalt emulsion?
  - 1. Water only
  - 2. Soap only
  - 3. Water and soap
  - 4. Kerosene
- 6-27. What road tar symbol designates a hot tar?
  - 1. RT 1
  - 2. RT 2
  - 3. RT 5
  - 4. RT 9

Learning Objective: Recognize the test for identifying bituminous materials.

- 6-28. Field identification of bituminous materials found stockpiled in unmarked containers is necessary for which of the following reasons?
  - To determine the type and method of construction the material can be used for
  - To establish safe handling practices for the material
  - 3. To determine type and quality of equipment needed
  - 4. All of the above

- 6-29. Normally, what field test is used to differentiate between unknown bituminous materials?
  - 1. Heat-odor
  - 2. Volubility
  - 3. Water-mixing
  - 4. Penetration
- 6-30. When you are performing the volubility test, what material will form a stringy undissolved 6-36. mass?
  - 1. Asphalt
  - 2. Asphalt cement
  - 3. Emulsion
  - 4. Tar
- 6-31. Asphalt cutbacks are fluid at room temperature.
  - 1. True
  - 2. False
- 6-32. What grade of asphalt is indicated by a field test in which the sharp point of pencil penetrates the asphalt with difficulty?
  - 1. Hard
  - 2. Medium
  - 3. Soft
  - 4. Medium hard

Learning Objective: Recognize and compute estimates of materials.

- 6-33. What is the purpose of a prime coat?
  - 1. Waterproof the surface
  - 2. Plug capillary voids
  - Coat and bond loose particles
  - 4. All of the above
- 6-34. If the ROA is not known, what ROA is used in the NCF for planning purposes?
  - 1. .1
  - 2. .2
  - 3. .3
  - 4. .4

- 6-35. How many gallons of prime coat is require for a project 2 miles long, 12 feet wide, waste factor of 5 percent, and a ROA of 0.3 gal/sq yd?
  - 1. 4435.2 gal
  - 2. 5174.4 gal
  - 3. 6336 gal
  - 4. 7392 gal
- 6-36. What happens when a tack coat is applied too heavily?
  - 1. Soaks into the surface material
  - 2. The overlying coarse will not stick to the surface coarse
  - 3. It will bleed into the overlying coarse
  - 4. It will cause the surface coarse to crumble
- 6-37. For the purpose of planning, what is the NCF ROA for a tack coat?
  - 1. .10
  - 2. .15
  - 3. .20
  - 4. .25
- 6-38. A total of how many drums of tack coat material is required for a project 500 feet long, 50 feet wide, waste factor of 5 percent, and a ROA of .15?
  - 1. 8.25 drums
  - 2. 11.79 drums
  - 3. 43.74 drums
  - 4. 82.54 drums
- 6-39. You are tasked with a single surface treatment of a road 20 miles long, 12 feet wide, and a waste factor of 10 percent. A 100-square/yard test strip showed that 2 tons of aggregate was used. What is the rate of application of aggregate in pounds per sq/yd?
  - 1. 10
  - 2. 20
  - 3. 30
  - 4. 40

- 6-40. Using question 6-39, what total number of tons of aggregate is required for this task?
  - 1. 1548.8
  - 2. 2323.2
  - 3. 3097.6
  - 4. 3872.2
- 6-41. Using equation 2, a total of how many pounds per square inch would a 4-inch asphalt mat equal?
  - 1. 146
  - 2. 110
  - 3. 220
  - 4. 440
- 6-42. A total of how many tons of asphalt is required for a parking lot 120 feet long, 60 feet wide, 2 inches thick, with 5 percent waste factor?
  - 1. 33
  - 2. 46
  - 3. 92
  - 4. 331
- 6-43. The required tonnage of hot-mix asphalt for a project is 300 tons. The screed of the paver is set at 12 feet, and the depth of asphalt is 2 inches. Estimate the amount of asphalt that can be laid per hour?
  - 1. 34.68
  - 2. 80.46
  - 3. 96.55
  - 4. 102.4
- 6-44. When using the horn signal system, what does two blasts of the horn mean?
  - 1. Stop
  - 2. Go forward
  - 3. Turn around
  - 4. Back up

Learning Objective: Identify fundamentals of developing sources of ground water.

- 6-45. In which underground zone, if any, should a water well be developed?
  - 1. Plant zone
  - 2. Saturated
  - 3. Aeration
  - 4. None
- 6-46. Which of the following belts is NOT part of the zone of aeration?
  - 1. Soil moisture
  - 2. Intermediate
  - 3. Saturation
  - 4. Capillary fringe
- 6-47. What is the name of the water contained in the zone of aeration?
  - 1. Subsurface water
  - 2. Ground water
  - 3. Soil water
  - 4. Surface water
- 6-48. What formation is porous and permeable and can yield usable quantities of water?
  - 1. Artesian
  - 2. Alluvial basin
  - 3. Aquifer
  - 4. Capillary fringe
- 6-49. An artesian well is a source of fresh water flowing freely from an aquifer in which the water pressure exceeds atmospheric pressure.
  - 1. True
  - 2. False
- 6-50. Which of the following rock formations is most likely to produce water in usable quantities?
  - 1. Igneous
  - 2. Sedimentary
  - 3. Alluvial
  - 4. Metamorphic

- 6-51. When nothing is known of the water resources in a particular area, the existence of water-producing formations can be verified by which of the following means?
  - 1. Exploratory drilling
  - Inspecting outcrops of rock formations
  - 3. Studying maps and documents
  - 4. Each of the above
- 6-52. A "drilled" well is normally drilled to a depth of what number 6-57. of feet?
  - 1. 1,000
  - 2. 1,500
  - 3. 2,000
  - 4. 2,500

Learning Objective: Recognize the operation of rotary drilling.

- 6-53. What type of drilling method is used in areas where ground formations are loose and unconsolidated?
  - 1. Mud drilling
  - 2. Air drilling
  - 3. Down-hole-drilling
  - 4. Percussion drilling
- 6-54. During rotary drilling, a rapid yet smooth penetration of the drill bit is an indication that the bit is entering a
  - 1. bed of gravel
  - 2. formation of fine sand
  - 3. clay formation
  - 4. consolidated formation
- 6-55. Of the crew members operating the rotary well-drilling rig, who has the responsibility for carrying out the overall drilling program?
  - 1. The project supervisor
  - 2. The tool pusher
  - 3. The driller
  - 4. The derrick hand

- When nothing is known of the water 6-56. Personnel engaged in well-drilling resources in a particular area, operations should observe which of the existence of water-producing the following safety measures?
  - Wear tight fitting clothes while working around moving machinery
  - Wear gloves when handling wire rope or metal parts
  - Wear safety shoes and hard hats
  - 4. All of the above
  - 6-57. Which component of a kelly-drive rotary well-drilling rig is connected to the top joint of the drill pipe?
    - 1. The hoisting plug
    - 2. The kelly
    - 3. The water swivel
    - 4. The drill collar
  - 6-58. Which of the following components of the kelly-drive rotary well-drilling rig controls the rate of feed to the drilling bit?
    - 1. The kelly drum brake
    - 2. The hoist drum
    - 3. The drill collar
    - 4. The rotating table
  - 6-59. On the kelly-drive rotary well-drilling rig, what accessory holds the drill pipe securely during joint addition or removal?
    - 1. The drill collar
    - 2. The hoisting plug
    - 3. The set of slips
    - 4. The kelly sub

- 6-60. In the operation of the rotary drilling rig, what factors work together to prevent the walls of the drill hole from collapsing when the cut material is washed to the surface by a mixture of mud and water?
  - The filtering action of the coarse material in the settling pit
  - 2. The weight and viscosity and the plastering action of the fluid on the wall of the well hole
  - 3. The action of suspended local mud in the fluid and the additional weight of the fluid due to its content of suspended clay
  - 4. The suspension of cuttings in the settling pit and the spiraling of the fluid against the wall of the drill hole
- 6-61. What is considered the normal quantity of water needed to support an 8 hour shift of rotary well-drilling?
  - 1. 100 to 500 gallons
  - 2. 500 to 750 gallons
  - 3. 750 to 1,000 gallons
  - 4. 1,000 to 4,000 gallons
- 6-62. What type of drill bit is used for drilling through a moderately hard surface formation with a rotary rig?
  - 1. Pilot
  - 2. Roller
  - 3. Fishtail
  - 4. Three way
- 6-63. After the well hole has been drilled the length of the kelly, what accessory is placed to keep the well from caving in from the surface?
  - 1. Turntable
  - 2. Surface casing
  - 3. Drill collar
  - 4. Set of slips

- 6-64. What depth is the top-head drive rotary well-drilling rig capable of rotary drilling?
  - 1. 900 feet
  - 2. 1,000 feet
  - 3. 1,250 feet
  - 4. 1,500 feet
- 6-65. On the ITWD, what is the purpose of the split centralizer?
  - 1. To break and make drill pipe connections
  - 2. To support the drill string during handling
  - 3. To aid in setting casings
  - 4. All of the above
  - 6-66. What material is used to lubricate the top-head spindle sub threads?
    - 1. Drilling lubricant
    - 2. Petroleum jelly
    - 3. Pipe dope
    - 4. Fish oil
- 6-67. When performing down-hole-drilling operations, how is the oil flow checked?
  - Inspecting the oil pattern on a piece of card board that is placed under the spindle
  - 2. Checking the amount of oil on the cuttings
  - 3. Placing your hand under the hammer and inspecting the amount of oil discharged
  - 4. Disconnecting the flushing hose and inspecting the amount of oil discharged from the hose

Learning Objective: Recognize drilling difficulties and the development of a water well.

- 6-68. One method of regaining a loss of circulation that takes place during well drilling is to circulate the cuttings away from the drill bit with plenty of water.
  - 1. True
  - 2. False
- 6-69. Undue wear of the drill pipe is an indication of a crooked drill hole.
  - 1. True
  - 2. False
- 6-70. During a drilling operation, the drill pipe may stick due to which of the following causes?
  - A mud pump of inadequate capacity
  - Allowing the drill pipe to stop and remain stationary in the hole
  - Mud balling up around the drill collar and bit
  - 4. All of the above
- 6-71. The drill pipe of your rotary well-drilling rig becomes stuck with drill cuttings that have accumulated in the hole. How can you remedy the situation?
  - 1. Pull upward on the pipe with jacks
  - 2. Circulate heavy mud while trying to turn the pipe
  - Pour oil along the sides of the pipe
  - 4. Pull upward on the pipe and circulate clear water around it

- 6-72. Which of the following is a practical use of a fishing tool?
  - Recovery of a twisted-off drill pipe
  - Recovery of a wrench that falls into the drill hole
  - 3. Recovery of a drill pipe that falls into the drill hole
  - 4. Each of the above
- 6-73. The setting of the casing and screens is the first operation in developing a well after the borehole is drilled.
  - 1. True
  - 2. False
- 6-74. Gravel packing is placing ungraded aggregate on the outside of the casing to allow for more production and prevent fines from entering the well pump.
  - 1. True
  - 2. False
- 6-75. In completing a developed well, the space between the well wall and casing is cemented to
  - trap the drilling mud below the water table
  - keep surface water or contaminated water from seeping into the aquifer
  - 3. prevent the drilling mud from solidifying
  - 4. All of the above

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